Design of Component Retrieval Algorithm using Enhanced Rating based Genetic

Nishi Gupta, Student, M.TECH- 2nd Yr, Patiala Institute Of Engineering And Technology, Punjab, India
Dr. Kailash Bahl, Dean Academics. Patiala Institute Of Engineering And Technology, Punjab, India

Abstract
The progress in the reuse of software components has made a tremendous success. However this advancement also brought about many challenges and issues such as how to find out exact component out of large repository. Because till yet they all lack up in reducing ambiguity. Based on this we have developed the enhanced rating based component retrieval method with combination of keyword based search and genetic optimization search technique for finding the exact algorithm on the basis of genetic operators.

Keywords: component retrieval, Keyword based search, genetic optimization algorithm, Reusable components.

Introduction
Software reuse process is gaining progress world wide due to its popularity because of time saving and maximal production in minimum span of time, effort and cost. It is the process by which we reuse the existing software rather than building from scratch. In order to make this technique more refined we have developed the enhanced rating based component retrieval algorithm which will not only pick up the exact component but by using genetic operators after keyword based search make this search retrieval technique most efficient one for component retrieval. Genetic based search technique produces new population at each step by means of performance characteristics, evaluation recombination and survival of the fittest.

Techniques For Component Retrieval
a) Keyword Based Search Technique:
This technique is very simple and efficient in finding up the exact component from the repository. In this approach all possible components are retrieved. Here we are using keyword based search prior to genetic one so that our search should be confined within limited scope rather than going for wild search.

b) Signature Based Retrieval Technique
The user can based his search on the basis of any particular characteristics of components. This technique is very efficient than the keyword based search

c) Formal Specifications:
Formal specifications used mathematical notations to describe the properties of computer system without ruling the way in which these properties are achieved. These describe the functionality done by system rather than actual description that is how it has done. These abstractions make this technique for developing a computer system because they allow question about which the system do confidentially

d) Genetic Algorithm Approach:
The basic concept of survival of fittest is coined by Charles Darwin. This technique is used when no mathematical analysis is available before.

Methods are not adequate. This will do the selection of components on the basis of various operators:

a) Selection and reproduction: Develop initial population and select an individual best fit in the whole population.
b) Crossover: From the components, it will select the exact component by crossing over between two components.
c) Mutation: After cross over mutation will take place. This will find the exact component.

Previous Work And Research
Previously algorithm have been implemented based on ranking of components using keyword or semantic based approach which reduces ambiguity up to some extent but not very much optimized solution for finding the best component especially when our repository is too large. So here we developed the algorithm using keyword and genetic based approach. This approach makes the rating of components more effective and the algorithm more appropriate especially for large repositories.

Proposed Model:
This model has been implemented in two phases:

a) Extraction of component using genetic operators
b) Rating of components
The first one extracts the component on the basis of keyword based search. Here we use the keyword based search prior to genetic one so that the search be remained confined as per the user query rather than going for wild search. Keyword based technique is descriptive technique. This technique is not very efficient. So we are using genetic based search after keyword based search
which offers robust non linear search technique that is particularly suited for complex problems and large repositories. It is the most effective search based method for finding up the exact solution. It takes advantage of old knowledge held in parent population to generate new population or new solution with improved performance or by removing ambiguity. It produces new population at each step. New population is created by performance evaluating procedures and recombination on the basis of fitness value until the termination criteria is satisfied and here by chooses the component with maximum fitness value. The algorithm is designed using these two techniques to evaluate the best component.

Figure 1

Justification:
The repository is a link between development for reuse and here the problem emerges when to select the best component amongst the repository. Although there are many ways for choosing the best component among the repository, but unfortunately none of them being very efficient. So we have developed here combination of keyword and genetic based approach. Keyword based search prior to the genetic based so that search should be confined rather than doing wild search. Here we have chosen the genetic algorithm after the keyword based search because of the following characteristics of genetic optimization approach. It is very different than existing ones because genetic algorithm works with coding of variables. it works by exchange of information between randomly generated samples. They produce new population at each step and created further population by performance evaluation, relative procedures, recombination and survival of the fittest. This process repeats itself until the termination criteria is satisfied or selection of best component among the repository process is not over.

Component Description:
Repository contains highly sophisticated methods to store and retrieve components. This is particularly very important when the size of repository is too large. Here we have used tool to specify reusable components. Description of components is done in such a way under repository that users are able to search their components. Based on the description stored for the effective retrieval of components using keyword based search by the user, it is utmost essential that repository should be maintained in well confined manner. All terms belonging to the repository should be well maintained.

Proposed Working
We will design algorithm that will first take the entry of component by the user of his choice using keyword based search. After that it will use genetic optimization approach. Further after that weight will be assign to the attributes and using various genetic operators

a) Selection and reproduction
b) Cross over
c) Mutation
First population will be selected after that usig the roulette wheel phenomena we will assign the fitness value to the attributes and the component having the maximum fitness value will be given to user by the system. In this population crossover of next and so on process will be done till our termination criteria will be satisfied. This algorithm will be converted into code using suitable interface and after that function of our system to make available the best component to the user will be fulfilled.

This system is more important these days because there is a maximum cost associated with a project of the company and developing a new project can be cost effective if we can use the reusable components if any associated with the project. but the project here comes for developer is how to opt the best component out of such a large repository. Here this problem is satisfied by our system.

Future Scope
The ranking of components can be done using different methodology
The genetic algorithm can be merged with any other technique to make the search more enhanced and productive.

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